

Leading Causes of Injury among California Children

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California Department of Public Health

California EMS for Children Educational Forum
Sacramento, California
November 6, 2014



Overview

- Injury surveillance data sources
- Leading causes of childhood injury
- From data collection to injury prevention

EMS Role in Data Collection

- Data Quality and Completeness are valuable for:
 - Understanding the injury circumstances
 - Preventing future injury

Injury Pyramid



Death Certificate Process

Death

Coroner file: investigation,
toxicology, autopsy

Selected info on electronic
death certificate

Department of Public Health codes to
standards of National Center for Health
Statistics

Creation of Death
Statistical Master File



Death Certificate

- Definitive demographics
- External cause of injury codes *
- Educational attainment

* International Classification of Diseases, Tenth Revision

Inpatient and Emergency Department Record Process

Injury (possible EMS transport)

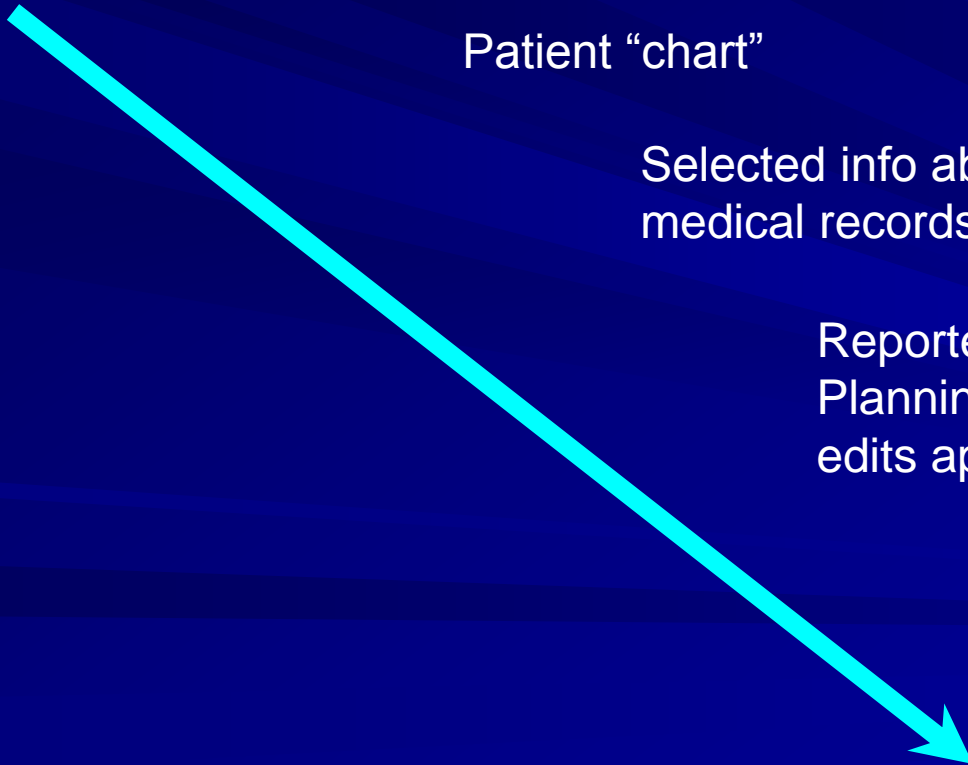
Admission to ED or hospital via ED.
Treat & release, or transfer

Patient "chart"

Selected info abstracted by hospital's
medical records department

Reported to Office of Statewide Health
Planning and Development. QA and
edits applied

Computer file sent to California
Department of Public Health



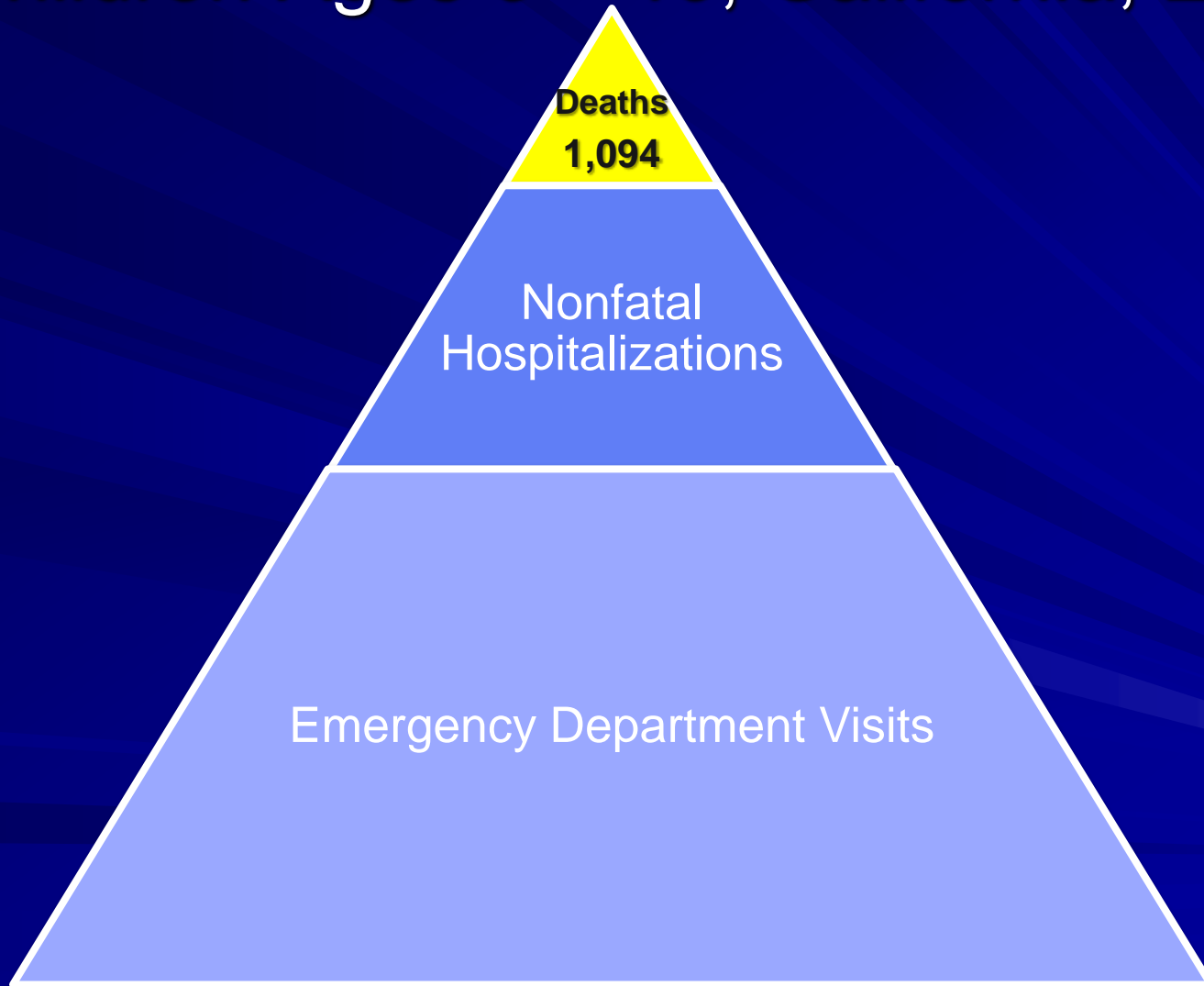
In-Patient and Emergency Department

- Demographics
- Definitive diagnoses
- External cause of injury codes *
- Length of stay (for inpatient)
- Patient Disposition
- Procedure “Charges” and who was billed

* International Classification of Diseases, Clinical Modification, Ninth Revision

Injury Pyramid

Children Ages 0 – 19, California, 2012



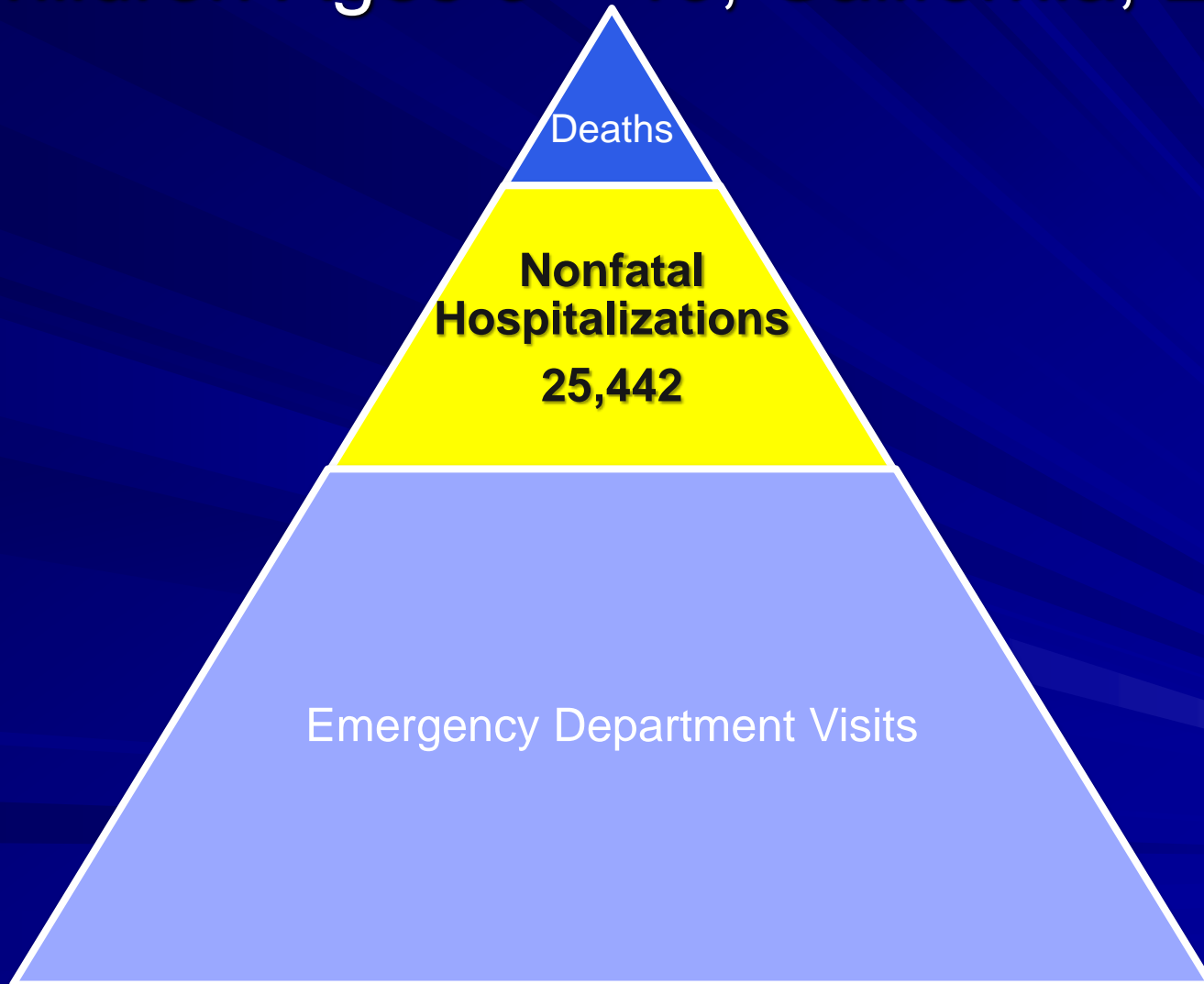
FIVE LEADING CAUSES OF INJURY DEATHS, CALIFORNIA

2012, ALL RACES, BOTH SEXES

AGE GROUPS					
RANK	< 1	1 TO 4	5 TO 9	10 TO 14	15 TO 19
1	Unintentional – Suffocation 30	Unintentional – Drowning / Submersion 40	Unintentional – MVT, Unspecified 13	Homicide / Assault 23	Homicide / Assault 256
2	Homicide / Assault 27	Homicide / Assault 31	Unintentional – Drowning / Submersion 11	Suicide / Self – Inflicted 19	Suicide / Self-Inflicted 129
3	Unintentional – MVT, Unspecified ...	Unintentional – MVT, Unspecified 17	Unintentional – MVT, Occupant ...	Unintentional – MVT, Pedestrian 13	Unintentional – MVT, Unspecified 92
4	UI – Drowning / Submersion ... UI – MVT, Occupant ...	Unintentional – Suffocation 13	Unintentional – MVT, Pedestrian ...	Unintentional – MVT, Unspecified 11	Unintentional – Poisoning 57
5	UI – Fall ... UI – Natural / Environment ... UI – Poisoning ...	Unintentional – Pedestrian, Other 12	Unintentional – Suffocation ...	Unintentional – Drowning / Submersion ...	Unintentional – MVT, Occupant 52

Injury Pyramid

Children Ages 0 – 19, California, 2012



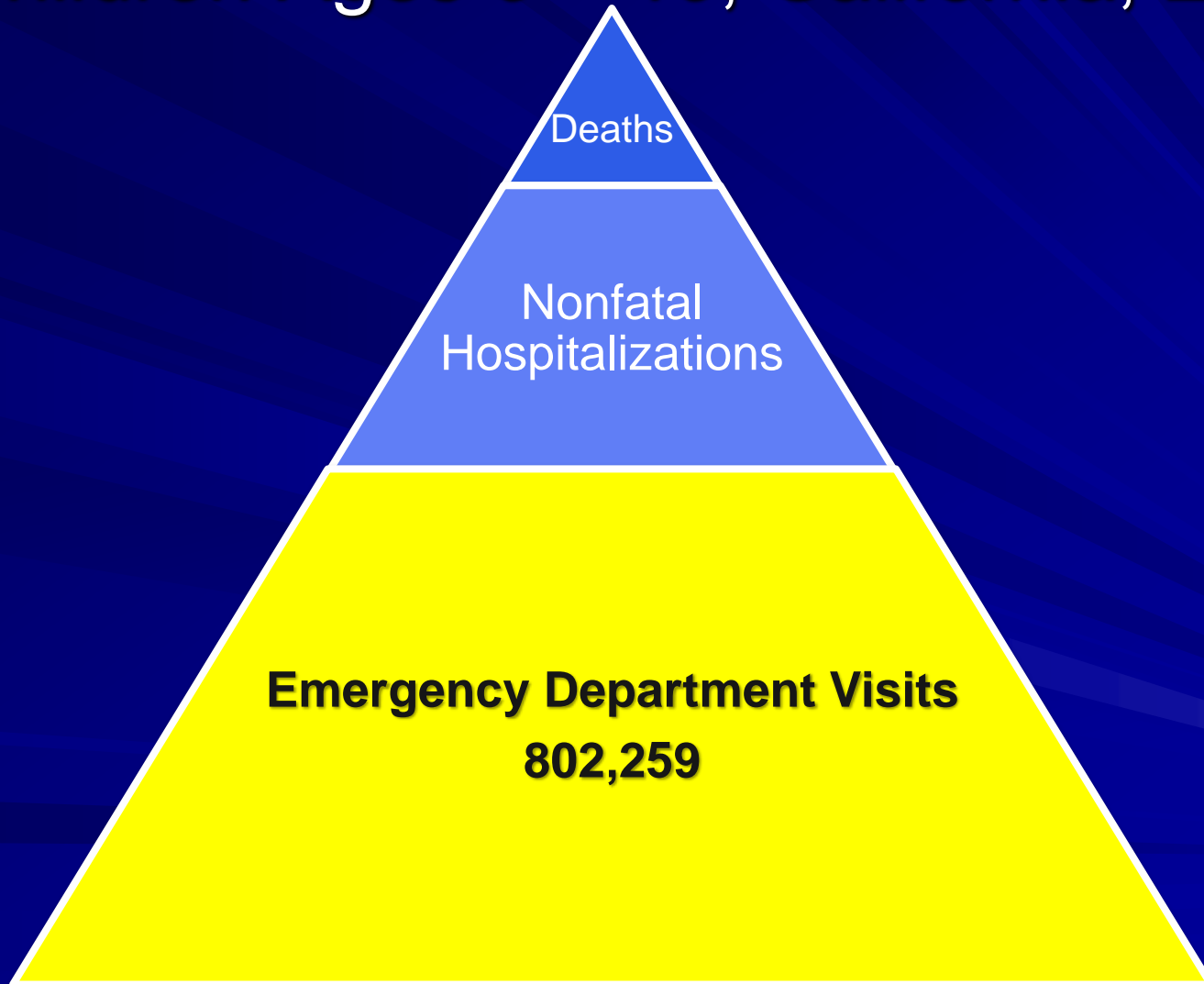
FIVE LEADING CAUSES OF NON-FATAL HOSPITALIZED INJURY, CALIFORNIA

2012, ALL RACES, BOTH SEXES

AGE GROUPS					
RANK	< 1	1 TO 4	5 TO 9	10 TO 14	15 TO 19
1	Unintentional – Fall 454	Unintentional – Fall 1,693	Unintentional – Fall 1,735	Unintentional – Fall 1,095	Suicide / Self – Inflicted 2,294
2	Homicide / Assault 166	Unintentional – Poisoning 588	Unintentional – Struck by Object 236	Suicide / Self – Inflicted 669	Homicide / Assault 1,515
3	Unintentional – Suffocation 124	Unintentional – Burn, Hot Object / Substance 469	Unintentional – Natural / Environment 228	Unintentional – Struck by Object 388	Unintentional – MVT, Occupant 1,265
4	Unintentional – Poisoning 123	Unintentional – Natural / Environment 295	Unintentional – MVT, Occupant 177	Unintentional – Bicyclist, Other 233	Unintentional – Fall 1,257
5	Unintentional – Burn, Hot Object /Substance 92	Unintentional – Struck by Object 216	Unintentional – Bicyclist, Other 159	Unintentional – MVT, Occupant 199	Unintentional – Struck by Object 595

Injury Pyramid

Children Ages 0 – 19, California, 2012

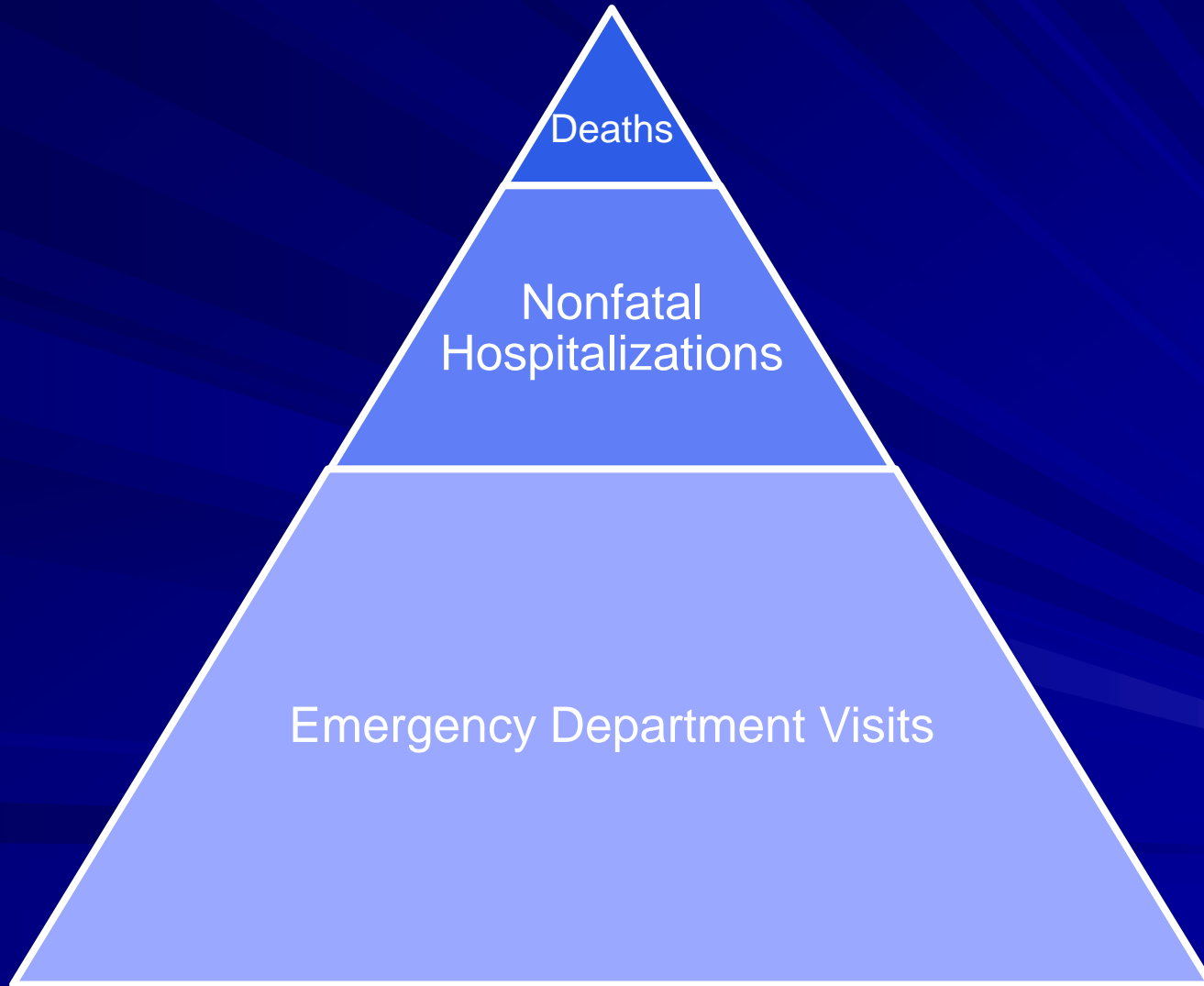


FIVE LEADING CAUSES OF EMERGENCY DEPARTMENT INJURY VISITS,
CALIFORNIA

2012, ALL RACES, BOTH SEXES

AGE GROUPS					
RANK	< 1	1 TO 4	5 TO 9	10 TO 14	15 TO 19
1	Unintentional – Fall 14,070	Unintentional – Fall 90,559	Unintentional – Fall 64,885	Unintentional – Fall 53,680	Unintentional – Struck by Object 43,404
2	Unintentional – Struck by Object 2,658	Unintentional – Struck by Object 32,240	Unintentional – Struck by Object 32,989	Unintentional – Struck by Object 46,273	Unintentional – Fall 38,714
3	Unintentional – MVT, Occupant 1,118	Unintentional – Natural / Environment 11,924	Unintentional – Natural / Environment 12,998	Unintentional – Overexertion 17,525	Unintentional – Overexertion 22,655
4	UI– Burn, Hot Object / Substance 937 UI– Poisoning 937	Unintentional – Overexertion 8,219	Unintentional – Cut / Pierce 9,142	Unintentional – Cut / Pierce 9,319	Unintentional – MVT, Occupant 18,880
5	Unintentional – Natural / Environment 851	Unintentional – Cut / Pierce 7,992	Unintentional – Overexertion 5,688	Unintentional – Natural / Environment 8,652	Homicide / Assault 16,253

Injury Pyramid



**LEADING CAUSES OF INJURY RESULTING IN DEATH, NON-FATAL
HOSPITALIZATION AND EMERGENCY DEPARTMENT VISITS FOR SPECIFIC AGE
GROUPS, CALIFORNIA, 2012, ALL RACES, BOTH SEXES**

< 1 YEAR			
RANK	DEATH	NON-FATAL HOSPITALIZATION	EMERGENCY DEPARTMENT
1	Unintentional – Suffocation 30	Unintentional – Fall 454	Unintentional – Fall 14,070
2	Homicide / Assault 27	Homicide / Assault 166	Unintentional – Struck by Object 2,658
3	Unintentional – MVT, Unspecified ...	Unintentional – Suffocation 124	Unintentional – MVT, Occupant 1,118
4	Unintentional – Drowning / Submersion ...	Unintentional – Poisoning 123	Unintentional – Burn, Hot Object / Substance 937
	Unintentional – MVT, Occupant ...		Unintentional – Poisoning 937
5	UI – Fall ...	Unintentional – Burn, Hot Object / Substance 92	Unintentional – Natural / Environment 851
	UI – Natural / Environment ...		
	UI – Poisoning ...		

**LEADING CAUSES OF INJURY RESULTING IN DEATH, NON-FATAL
HOSPITALIZATION AND EMERGENCY DEPARTMENT VISITS FOR SPECIFIC AGE
GROUPS, CALIFORNIA, 2012, ALL RACES, BOTH SEXES**

1 TO 4 YEARS			
RANK	DEATH	NON-FATAL HOSPITALIZATION	EMERGENCY DEPARTMENT
1	Unintentional – Drowning / Submersion 40	Unintentional – Fall 1,693	Unintentional – Fall 90,559
2	Homicide / Assault 31	Unintentional – Poisoning 588	Unintentional – Struck by Object 32,240
3	Unintentional – MVT, Unspecified 17	Unintentional – Burn, Hot Object / Substance 469	Unintentional – Natural / Environment 11,924
4	Unintentional – Suffocation 13	Unintentional – Natural / Environment 295	Unintentional – Overexertion 8,219
5	Unintentional – Pedestrian, Other 12	Unintentional – Struck by Object 216	Unintentional – Cut / Pierce 7,992

Data Sources: Data Source: CA Dept. Of Public Health , Death Statistical Master File,
Office Of Statewide Health Planning and Development, Patient Discharge Data and Emergency Department Data.

**LEADING CAUSES OF INJURY RESULTING IN DEATH, NON-FATAL
HOSPITALIZATION AND EMERGENCY DEPARTMENT VISITS FOR SPECIFIC AGE
GROUPS, CALIFORNIA, 2012, ALL RACES, BOTH SEXES**

5 TO 9 YEARS			
RANK	DEATH	NON-FATAL HOSPITALIZATION	EMERGENCY DEPARTMENT
1	Unintentional – MVT, Unspecified 13	Unintentional – Fall 1,735	Unintentional – Fall 64,885
2	Unintentional – Drowning / Submersion 11	Unintentional – Struck by Object 236	Unintentional – Struck by Object 32,989
3	Unintentional – MVT, Occupant ...	Unintentional – Natural / Environment 228	Unintentional – Natural / Environment 12,998
4	Unintentional – MVT, Pedestrian ...	Unintentional – MVT, Occupant 177	Unintentional – Cut / Pierce 9,142
5	Unintentional – Suffocation ...	Unintentional – Bicyclist, Other 159	Unintentional – Overexertion 5,688

Data Sources: Data Source: CA Dept. Of Public Health , Death Statistical Master File,
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**LEADING CAUSES OF INJURY RESULTING IN DEATH, NON-FATAL
HOSPITALIZATION AND EMERGENCY DEPARTMENT VISITS FOR SPECIFIC AGE
GROUPS, CALIFORNIA, 2012, ALL RACES, BOTH SEXES**

10 TO 14 YEARS

RANK	DEATH	NON-FATAL HOSPITALIZATION	EMERGENCY DEPARTMENT
1	Homicide / Assault 23	Unintentional – Fall 1,095	Unintentional – Fall 53,680
2	Suicide / Self-Inflicted 19	Suicide / Self-Inflicted 669	Unintentional – Struck by Object 46,273
3	Unintentional – MVT, Pedestrian 13	Unintentional – Struck by Object 388	Unintentional – Overexertion 17,525
4	Unintentional – MVT, Unspecified 11	Unintentional – Bicyclist, Other 233	Unintentional – Cut / Pierce 9,319
5	Unintentional – Drowning / Submersion ...	Unintentional – MVT, Occupant 199	Unintentional – Natural / Environment 8,652

Data Sources: Data Source: CA Dept. Of Public Health , Death Statistical Master File,
Office Of Statewide Health Planning and Development, Patient Discharge Data and Emergency Department Data.

**LEADING CAUSES OF INJURY RESULTING IN DEATH, NON-FATAL
HOSPITALIZATION AND EMERGENCY DEPARTMENT VISITS FOR SPECIFIC AGE
GROUPS, CALIFORNIA, 2012, ALL RACES, BOTH SEXES**

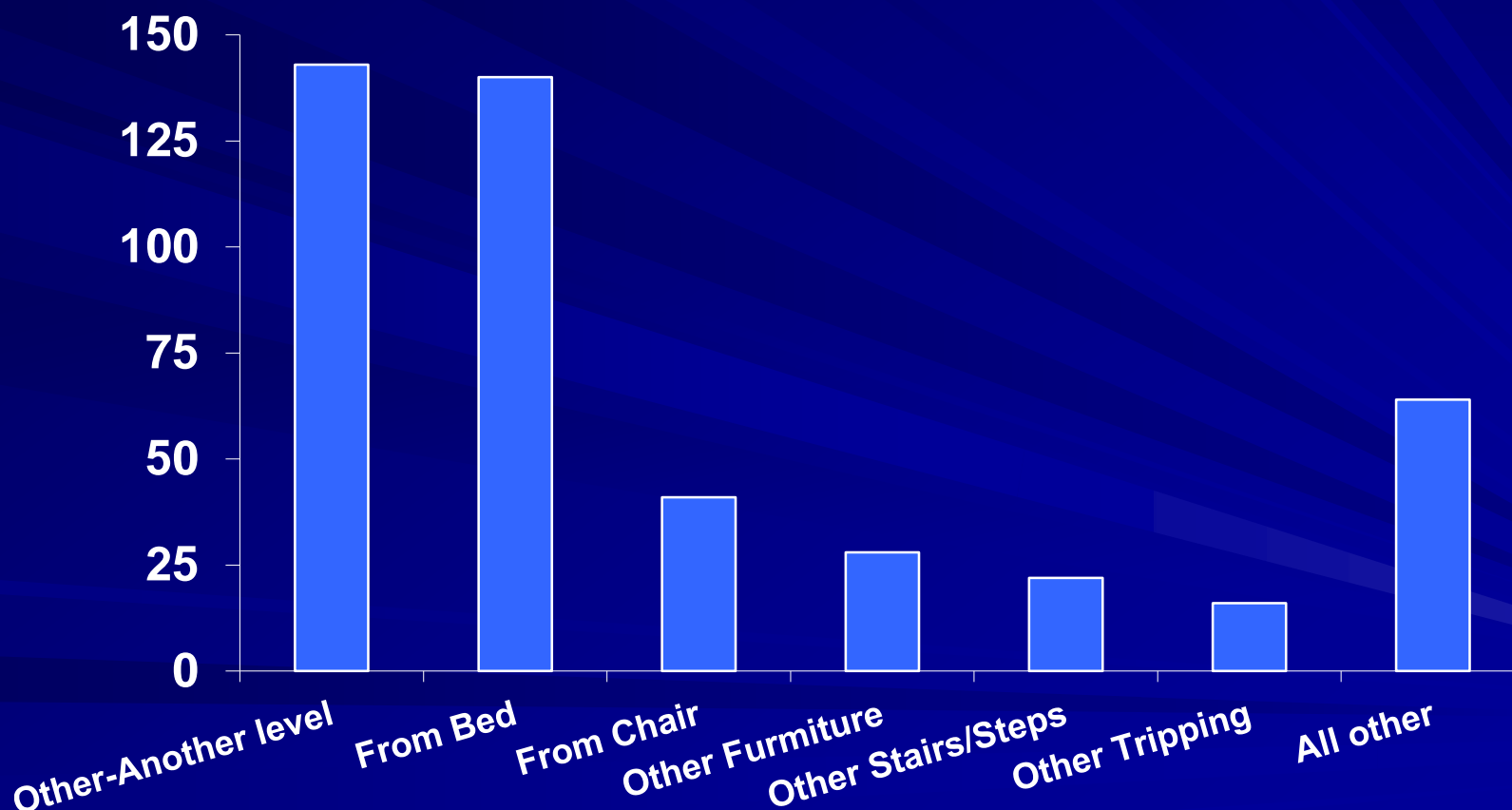
15 TO 19 YEARS			
RANK	DEATH	NON-FATAL HOSPITALIZATION	EMERGENCY DEPARTMENT
1	Homicide / Assault 256	Suicide / Self-Inflicted 2,294	Unintentional – Struck by Object 43,404
2	Suicide / Self-Inflicted 129	Homicide / Assault 1,515	Unintentional – Fall 38,714
3	Unintentional – MVT, Unspecified 92	Unintentional – MVT, Occupant 1,265	Unintentional – Overexertion 22,655
4	Unintentional – Poisoning 57	Unintentional – Fall 1,257	Unintentional – MVT, Occupant 18,880
5	Unintentional – MVT, Occupant 52	Unintentional – Struck by Object 595	Homicide / Assault 16,253

Data Sources: Data Source: CA Dept. Of Public Health , Death Statistical Master File,
Office Of Statewide Health Planning and Development, Patient Discharge Data and Emergency Department Data.

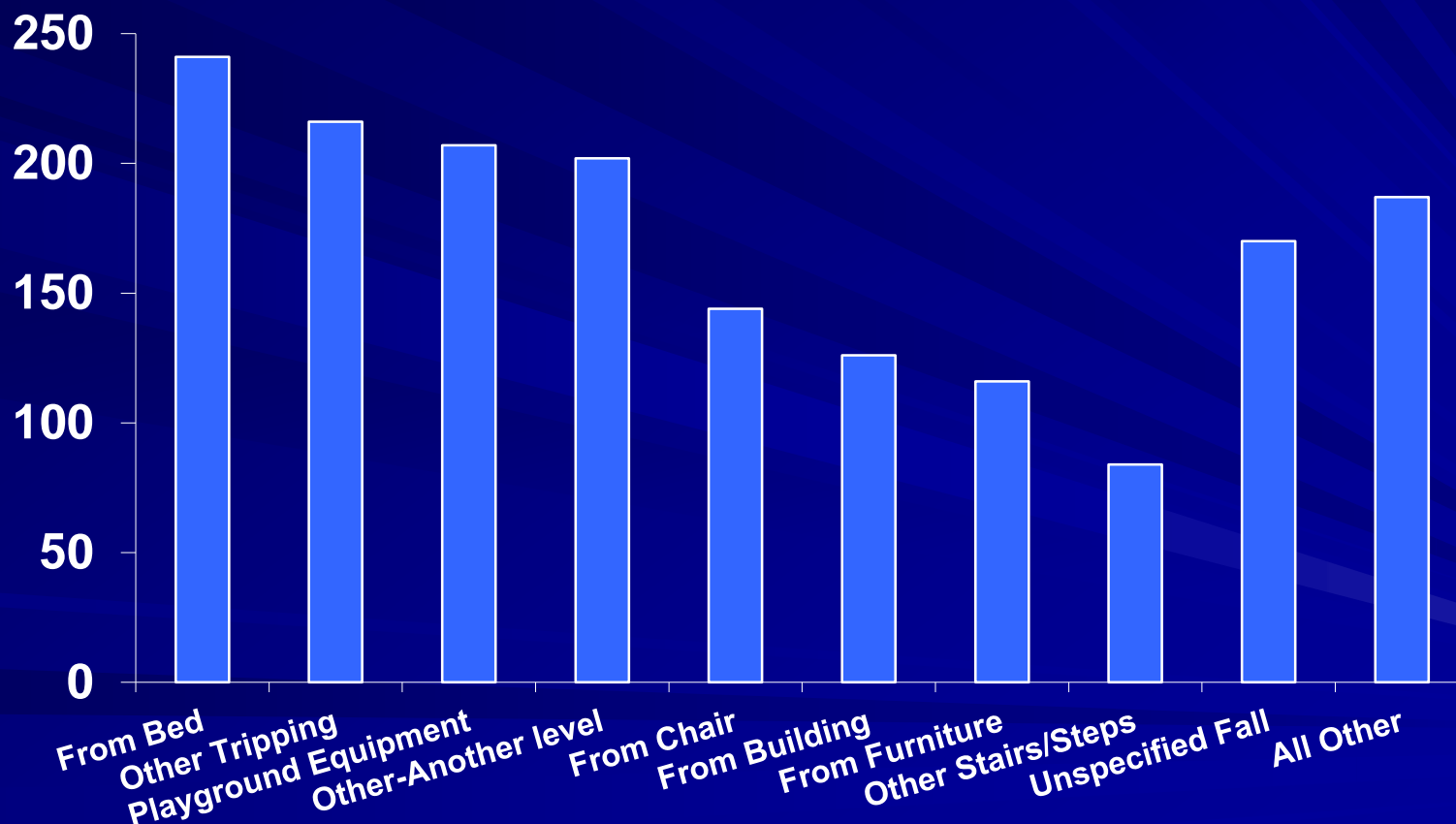
Non-fatal Fall Injuries, 2012

- Falls are *the* leading cause of non-fatal injury hospitalizations and emergency department visits for children 14 years of age and younger.
- Falls are the 4th leading cause of non-fatal injury hospitalizations and 2nd leading cause of non-fatal emergency department visits for children 15-19 years of age.

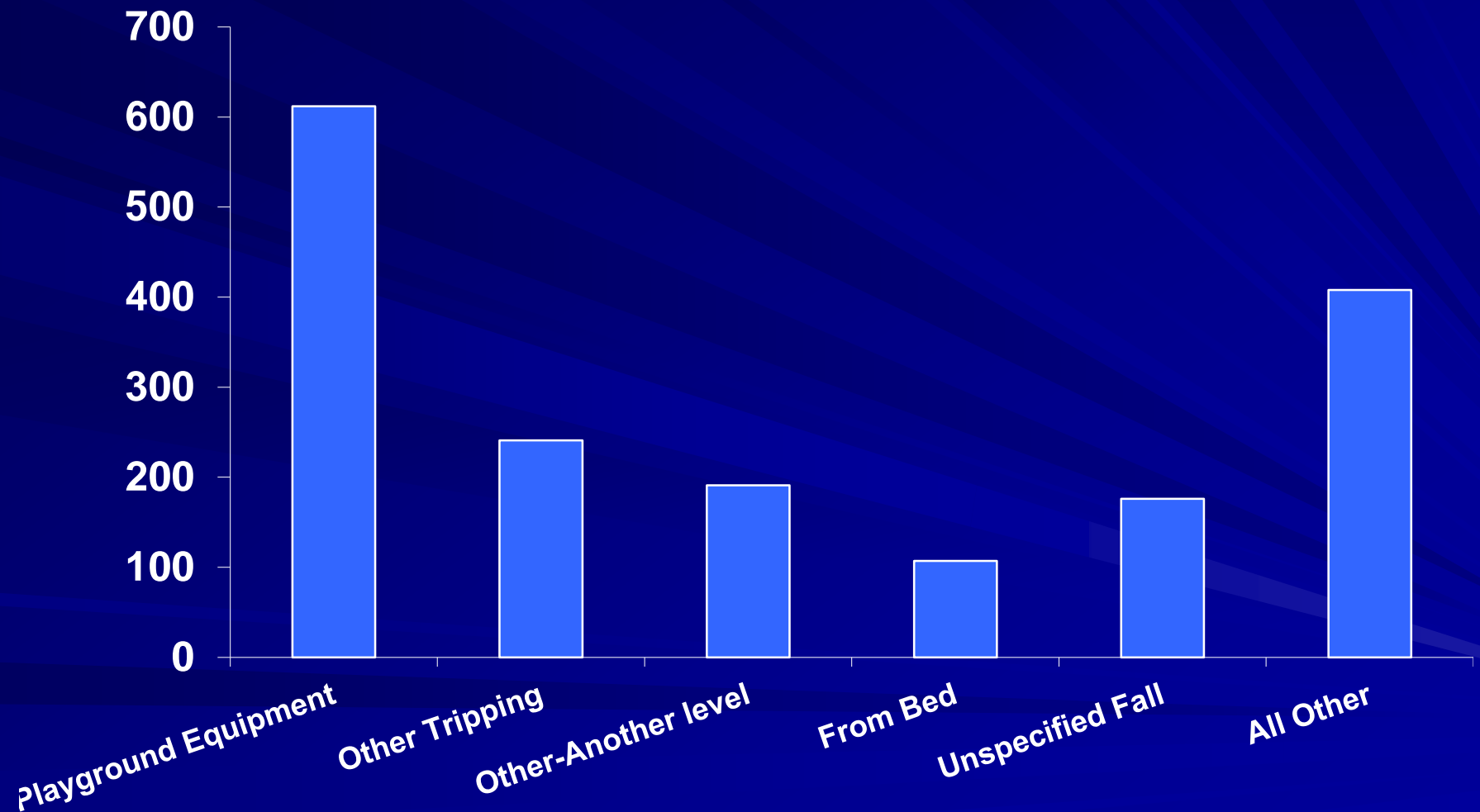
Non-fatal hospitalized falls, California residents, by specific cause of fall, Children Under 1 Year of Age, 2012



Non-fatal hospitalized fall injuries by specific cause of fall, Ages 1-4 Years California, 2012

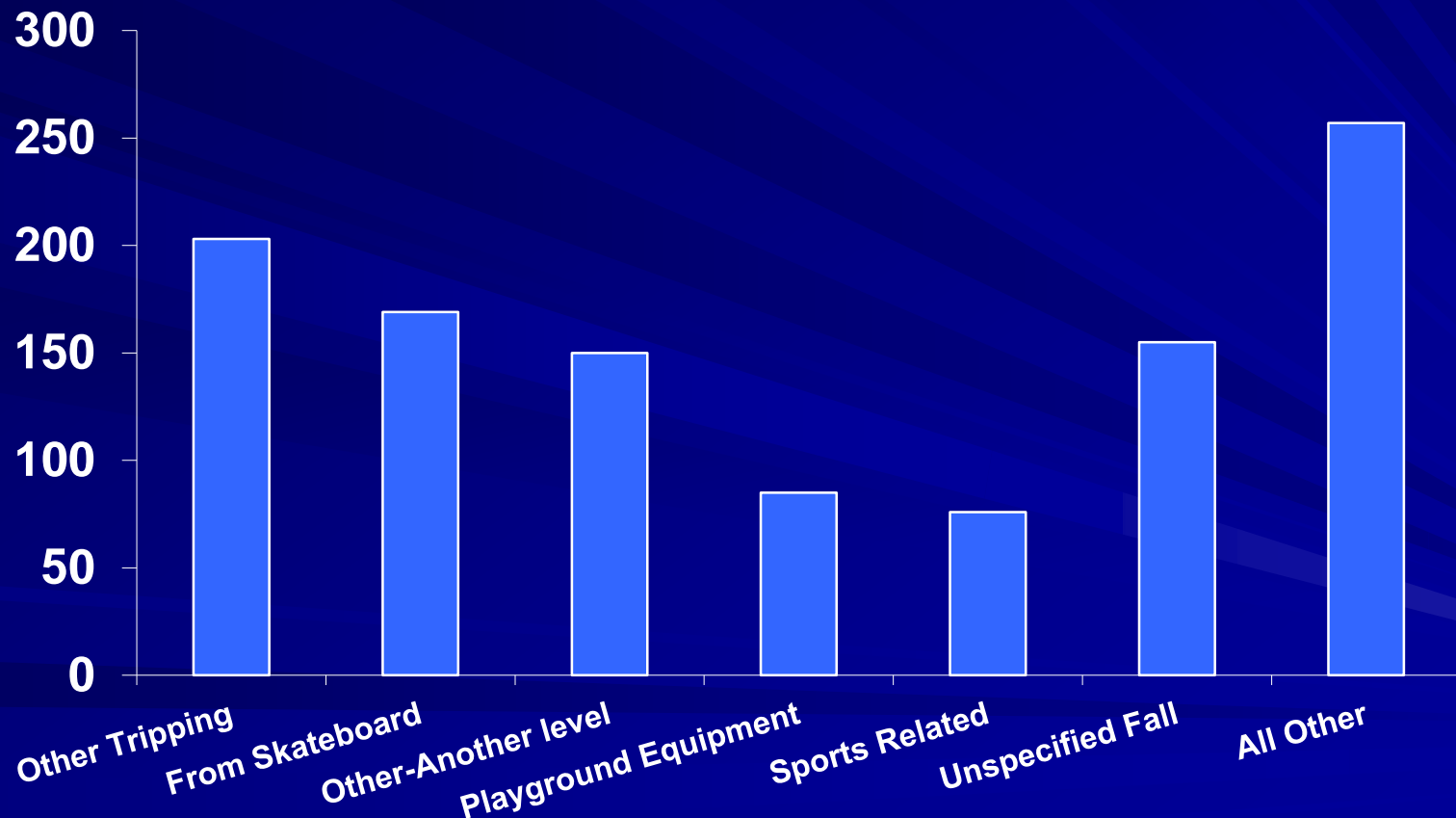


Non-fatal hospitalized fall injuries by specific cause of fall, Ages 5-9 Years California, 2012

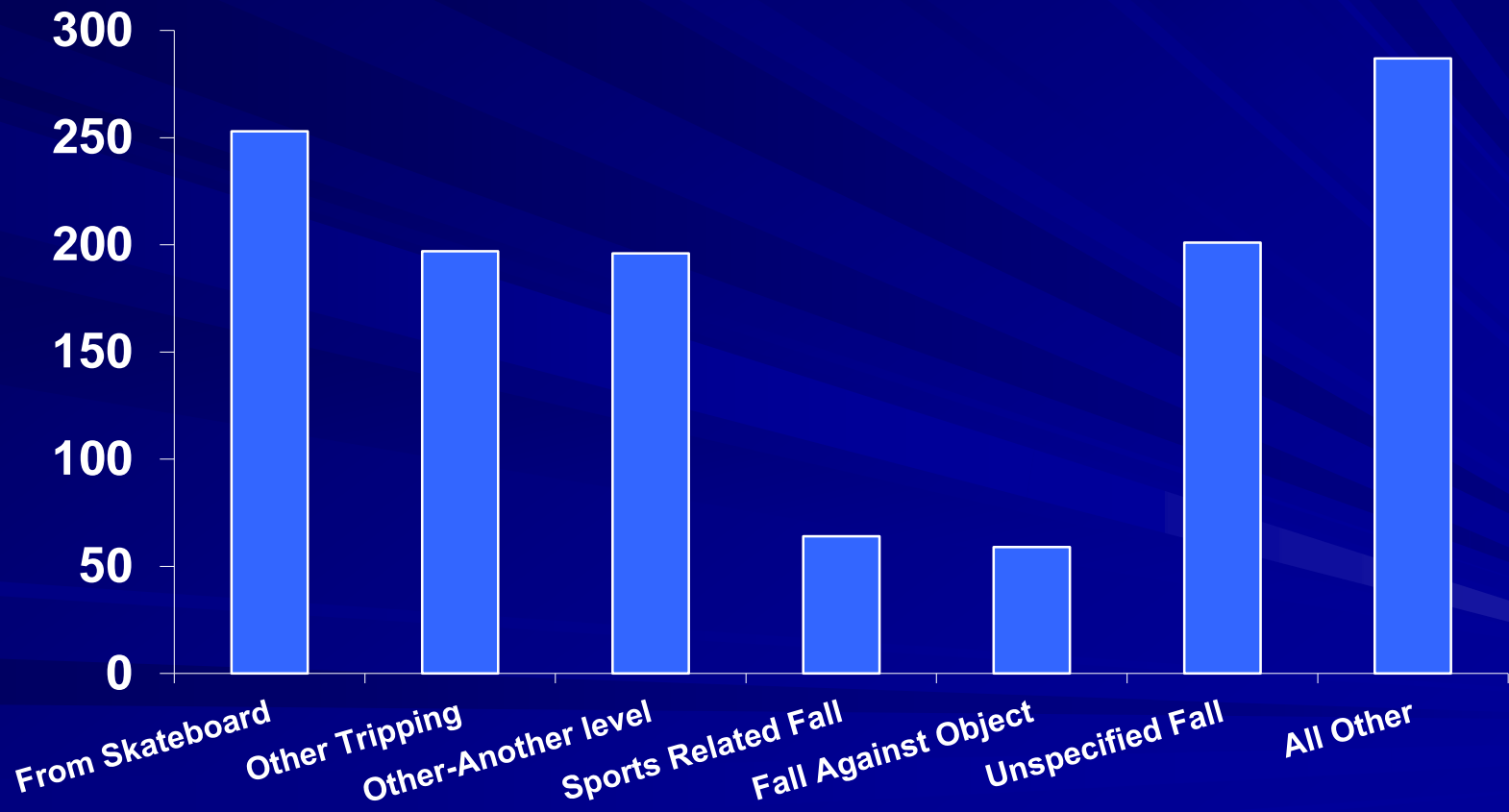


Source: Office of Statewide Planning and Development, 2012 Patient Discharge Data

Non-fatal hospitalized fall injuries by specific cause of fall, Ages 10-14 Years California, 2012



Non-fatal hospitalized fall injuries by specific cause of fall, Ages 15-19 Years California, 2012



Fall Prevention

- Playground safety
- Home safety
- Sport Safety

EpiCenter - California Injury Data Online

The screenshot shows the EpiCenter website with a blue header and a green navigation bar. The main content area is white with a left sidebar. The header includes the California Department of Public Health logo, the EpiCenter logo, and the Safe and Active Communities logo. The navigation bar has links for Overall Injury Surveillance, Selected Injury Topics, Injury Data Summaries, Traumatic Brain Injuries, Violent Death Circumstances, Alcohol/Drug Consequences, Population Data, and Linked Crash Medical Data. The left sidebar contains links for About our data, Tell us how you use our data, Help with building tables, Help with ICD-9 and ICD-10 codes, EpiCenter Home, CDPH Home, SAC Branch Home, and Contact Us. The main content area features a red banner for 2012 Death, Hospital and ED data, followed by sections for Overall Injury Surveillance, Selected Injury Topics, Injury Data Summaries, Population Data, California Electronic Violent Death Reporting System, Alcohol and Other Drug (AOD) Health Consequences, and Linked Crash Medical Data. The footer includes a disclaimer, logos for the David and Lucile Packard Foundation, The California Wellness Foundation, and the CDC, along with a copyright notice for 2010 State of California.

California Department of Public Health CDPH

EpiCenter
California Injury Data Online

Safe and Active Communities

Overall Injury Surveillance | Selected Injury Topics | Injury Data Summaries | Traumatic Brain Injuries | Violent Death Circumstances | Alcohol/Drug Consequences | Population Data | Linked Crash Medical Data

About our data
Tell us how you use our data
Help with building tables
Help with ICD-9 and ICD-10 codes
EpiCenter Home
CDPH Home
SAC Branch Home
Contact Us

2012 Death, Hospital and ED data now available!
Build Your Own Tables

[Overall Injury Surveillance](#)
The most versatile and comprehensive source of California injury data. It includes all types of injuries that result in death, hospitalization, or an emergency department visit.

[Traumatic Brain Injury \(TBI\)](#)
Data on hospital and emergency department patients with non-fatal TBIs.

[California Electronic Violent Death Reporting System](#)
Data on violent death circumstances from several sources. Includes homicides, suicides, unintentional firearm deaths, and deaths of undetermined intent.

[Alcohol and Other Drug \(AOD\) Health Consequences](#)
Hospital and ED data available on AOD poisoning (overdose), mental disorder, and physical disease.

[Linked Crash Medical Data](#)
Data combined from police traffic crash reports and medical data from emergency departments, hospitals, and death files.

[Selected Injury Topics](#)
Data on the following injuries:

- Assault (homicide)
- Bicycle
- Firearm
- Heat
- Motor vehicle occupant
- Pedestrian
- Self-inflicted (suicide)
- Senior falls
- Assaults on females
- Intimate partner assaults on females

[Injury Data Summaries](#)

- Injuries by Cause and Age
- Top Five Causes of Injuries
- Injury Trends

[Population Data](#)
California population data available by county, year, age, gender, and race/ethnicity based on California Department of Finance (DOF) data.

EpiCenter was designed by the Safe and Active Communities Branch and constructed by the Information Technology Services Division of the California Department of Public Health. We are grateful to the funders whose generosity made EpiCenter possible.

David and Lucile Packard Foundation | The California Wellness Foundation | CDC

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<http://epicenter.cdph.ca.gov/>

EpiCenter - California Injury Data Online

The screenshot shows the EpiCenter website interface. At the top, there are three logos: the California Department of Public Health (CDPH) logo on the left, the EpiCenter logo in the center, and the Safe and Active Communities logo on the right. Below the logos is a horizontal navigation bar with eight green buttons. The bottom of the page features a light gray sidebar on the left and a white main content area on the right.

California Department of
Public Health CDPH

EpiCenter
California Injury Data Online

Safe and Active
communities

Overall Injury Surveillance	Selected Injury Topics	Injury Data Summaries	Traumatic Brain Injuries	Violent Death Circumstances	Alcohol/Drug Consequences	Population Data	Linked Crash-Medical Data
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About our data

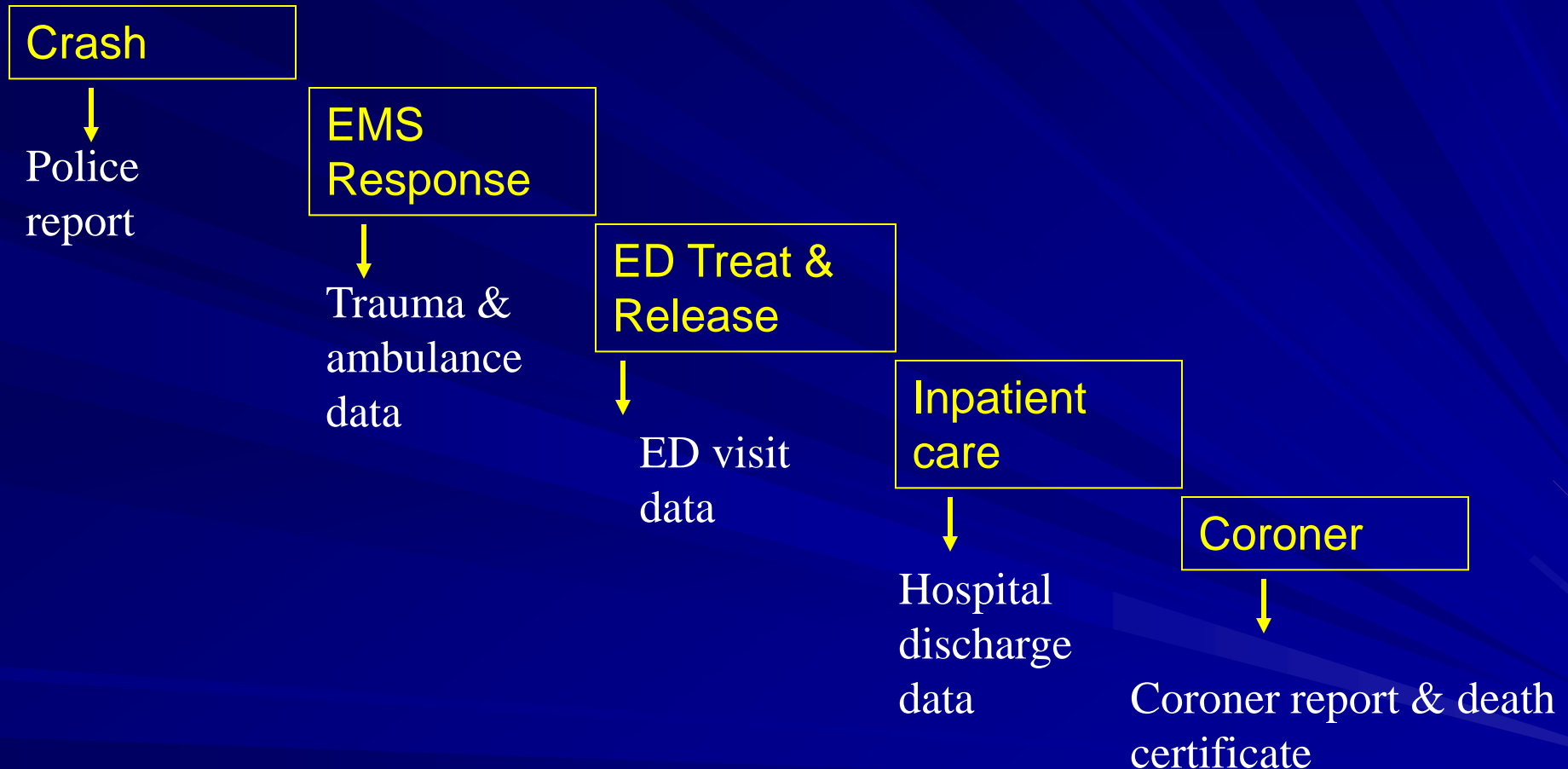
Tell us how you use our data

2012 Death, Hospital and ED data now available!
Build Your Own Tables

Crash Medical Outcome Data (CMOD) Project

- Funded by the California Office of Traffic Safety
- Major Goals:
 - Link crash records with death, hospitalization, and ED records data
 - Provide CMOD data through the CDPH, Safe and Active Communities Branch, EpiCenter -Injury Data Online Query

Continuum of Crash-Related Data



EpiCenter - California Injury Data Online

Linked Crash-Medical Data

California Department of
Public Health



EpiCenter
California Injury Data Online



[Overall Injury Surveillance](#) | [Selected Injury Topics](#) | [Injury Data Summaries](#) | [Traumatic Brain Injuries](#) | [Violent Death Circumstances](#) | [Alcohol/Drug Consequences](#) | [Poisoning Data](#) | [Linked Crash Medical Data](#)

[About our data](#)
[Tell us how you use our data](#)
[Help with building tables](#)
[Help with ICD-9 and ICD-10 codes](#)
[EpiCenter Home](#)
[CDPH Home](#)
[SAC Branch Home](#)
[Contact Us](#)

Crash Medical Outcomes Data

The Linked Crash-Medical Data come from the California Crash Medical Outcomes Data (CMOD) project, modeled on the [National Highway Traffic Safety Administration \(NHTSA\)](#) Crash Outcome Data Evaluation System (CODES). CMOD links data from police traffic crash records (i.e., scene investigators) to medical data (from emergency departments, hospitals, and, in a future update, death files). To learn more about CMOD data linkage, go to [this link](#).

For 2007-2011, 55% of injury crash records linked to a medical record and 45% did not. There are valid reasons why some records do not link. Some crash victims are never treated in a hospital or emergency department, and thus there are no medical outcomes data to report. In other cases, records do not have enough information for a positive match. The value of a linked data set is that it can be used to show how a victim's medical outcome depends on the characteristics of the person (such as age) and the circumstances of the crash (such as the type of collision). Because linked data do not include all cases, they cannot be used to describe all crashes or all crash injuries. For describing all injuries, use EpiCenter's [other datasets](#). For describing all crashes on California roadways, use the California Highway Patrol (CHP) SWITRS Reports [CHP SWITRS](#).

Funding for the CMOD Project and the online query is provided by a grant from the California Office of Traffic Safety through the National Highway Traffic Safety Administration.

[Submit](#) [Reset Choices](#)

Outcome:
☒ Non-fatal Emergency Department (treat and release, or transfer)
☐ Non-fatal Hospitalization

Year: From: 2007 through: 2011

Victim's Crash Role:
☒ All Crash Roles
☐ Motor Vehicle Driver
☐ Motor Vehicle Passenger
☐ Motorcyclist
☐ Pedestrian
☐ Bicyclist

Race/Ethnicity:

All Race/Ethnicity
White
Black
Hispanic

If selecting multiple race/ethnicity groups, hold down the Control key (Mac) or key (Mac users)

Age:
☒ All Ages
☐ Custom Age Range
From Age: through Age: years old (Enter "0" to capture those < 1 year old)

Output Format:
☒ HTML
☐ Excel
☐ PDF

EpiCenter - California Injury Data Online Linked Crash-Medical Data (cont.)

Is Reorganized (2) | COHS Is Reorganized

☐ Non-fatal Hospitalization

Year: From 2007 through 2011

Victim's Crash Role:

- ☒ All Crash Roles
- ☐ Motor Vehicle Driver
- ☐ Motor Vehicle Passenger
- ☐ Motorcyclist
- ☐ Pedestrian
- ☐ Bicyclist

Race/Ethnicity: If selecting multiple race/ethnicity groups, hold down the Control key (Mac key for Mac users).

Age:

- ☒ All Ages
- ☐ Custom Age Range

From Age: through Age: years old (Enter "0" to capture those < 1 year old)

Output Format:

- ☒ HTML
- ☐ Excel
- ☐ PDF

If tables fail to appear, turn off your browser's pop-up blocker.
A suggested citation appears on output page.

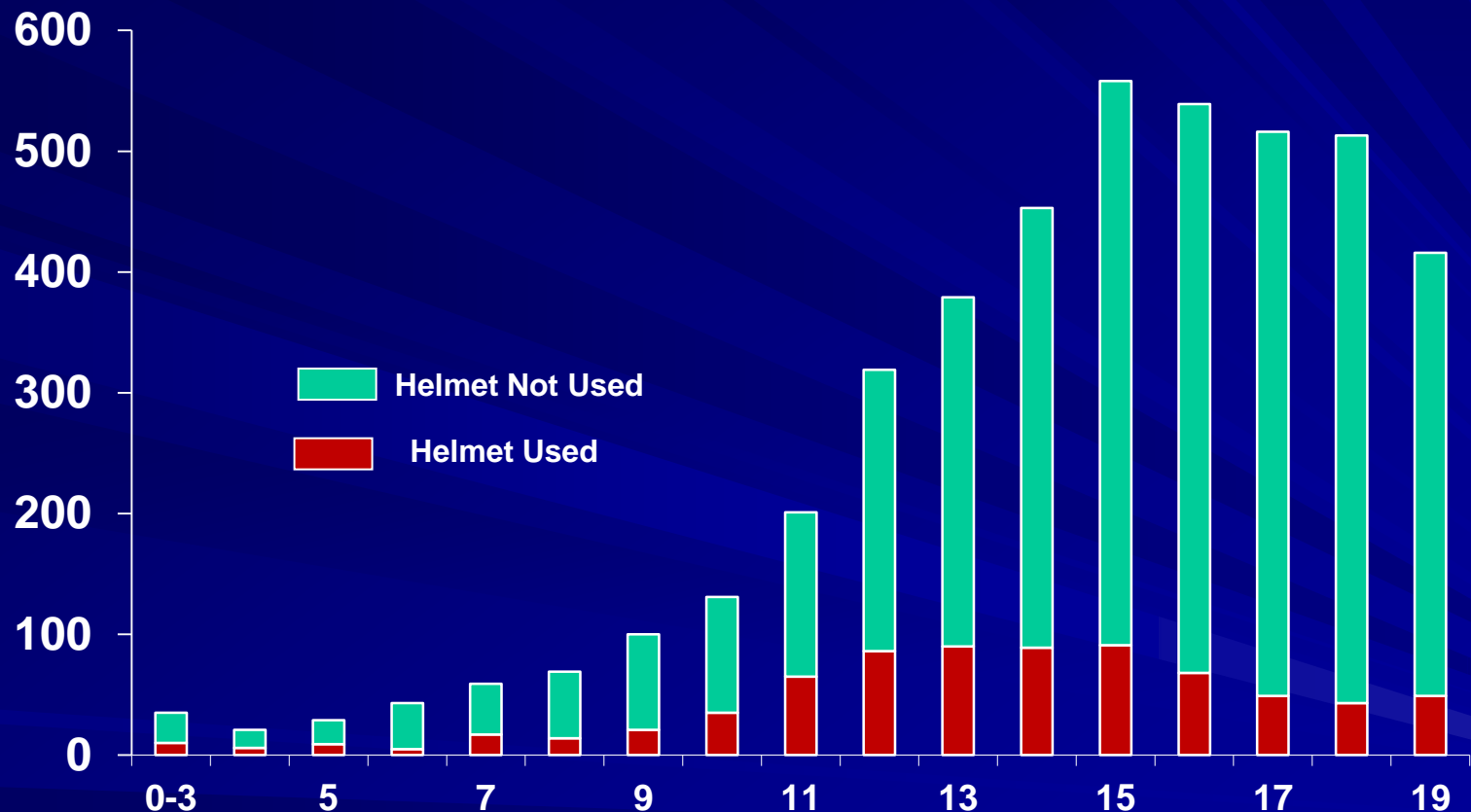
Additional Detail
Select up to three options for more detailed tables, e.g., by race/ethnicity, age, etc.

First level of detail

Second level of detail

Third level of detail

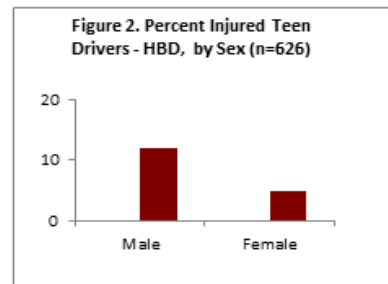
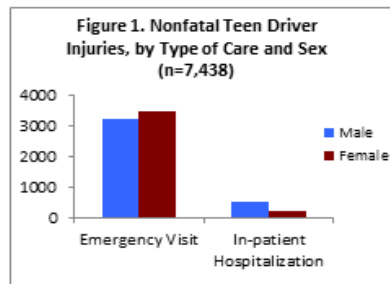
Number of bicyclists injured or killed, by age and helmet use, through age 19 years, California, 2012



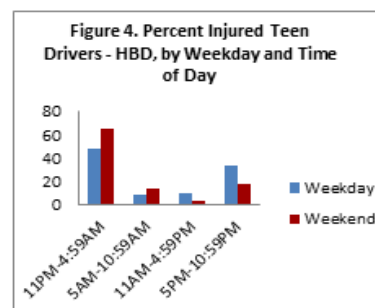
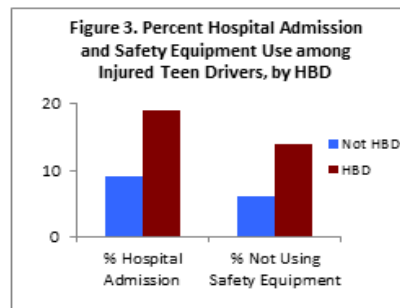
Injuries to Teens Who Drink and Drive

For California teens (ages 16-19), car crashes are the leading cause of non-fatal, unintentional injury requiring hospitalization (1). In 2009, the California Highway Patrol (CHP) reported 11,729 teen drivers were injured as a result of their involvement in a car crash – most (98%) were non-fatal injuries (2). In this report, we focus on the 7,438 non-fatally injured teen drivers for whom we have Crash-Medical linked data* from 2009, with special attention to those who had been drinking (HBD).

The vast majority of injured teen drivers were treated at an emergency department (ED), while nearly 10% were seriously injured, requiring hospitalization. Female drivers were slightly more likely than male drivers to be treated and released for injuries from the ED. Males were twice as likely to require hospitalization (Figure 1). Overall, 8% of the non-fatally injured teen drivers HBD - 12% of males and 5% of female teen drivers (Figure 2).



- The percent of HBD injured teen drivers admitted to the hospital was twice that of those who had not been drinking (19% versus 9%) (Figure 3).
- Similarly, the percent of HBD injured teen drivers not using safety equipment (i.e. seat belts, helmets)** was more than twice that of those who had not been drinking (14% versus 6%) (Figure 3).
- Although not shown, HBD injured teen drivers were also more likely to have been at fault in the collision (93% versus 63%), crashed on weekend evenings, and in collisions in which the vehicle overturned (13% versus 8%) or hit an object (49% versus 21%).
- More than one-half (57%) of injuries to HBD teen drivers occurred between 11 PM and 5 AM (Figure 4).



Role of Data Collection

- Importance of complete on scene information
- Injury prevention is improved with accurate and complete data documentation

Spectrum of Prevention



Adapted from Cohen, L. & Swift, S. The Spectrum of Prevention: Developing a comprehensive approach to injury prevention. *Injury Prevention*, 1999, 5:203-207 & Rattray, T., Brunner, W. & Freestone, J. The New Spectrum of Prevention: A model for public health practice. *Contra Costa Health Services*, 4/2002.

Acknowledgement

Funding for the CMOD Project was provided by a grant from the California Office of Traffic Safety, through the National Highway Traffic Safety Administration.



Questions?

Contact Information

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